Leslie M. Frost Natural Resource Centre Fisheries Management Plan

1986-2000

Ontario

Ministry of Natural Resources

Vincent G. Kerrio
Minister

1.0 INTRODUCTION

1.1 Purpose

The purpose of the Frost Centre's Fisheries Management Plan is to provide long-term direction for implementing the fisheries programme to the year 2000. It is intended to improve the efficiency and order of the programme. In addition, it will indicate, through a series of implementation schedules the specific short-term activities that will be initiated in the next five years. Annual work plans will be submitted for approval and funding based on the priorities established in the schedules.

This Plan applies to the Leslie M. Frost Natural Resources Centre which comprises 23,700 hectares (ha) of land and water in portions of Sherborne, Hindon, Havelock, and Stanhope Townships in Haliburton County, and Ridout Township in the District Municipality of Muskoka (see Figure 2). The Frost Centre straddles two Ministry of Natural Resources districts, Bracebridge and Minden.

1.2 Planning Process

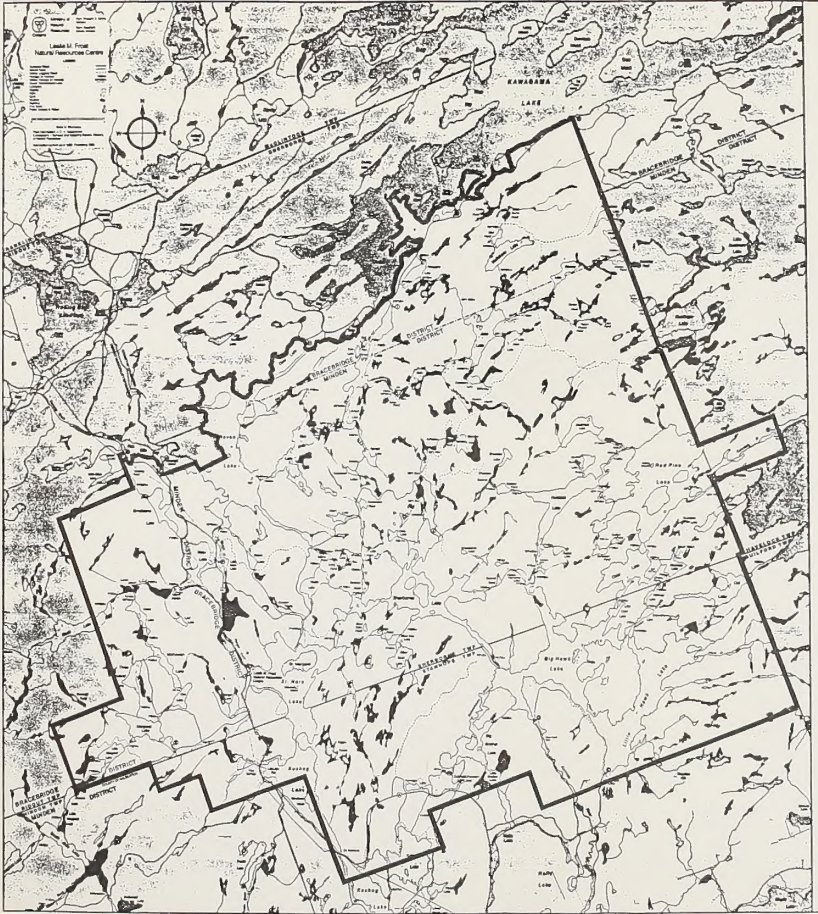
The Fisheries Management Plan has been prepared as part of the Ministry's overall resource planning and management system. This system emphasizes an integrated approach.

Broad direction for the Ministry's resource management activities, in the form of general policies, targets, and resource management guidelines, is provided in the Southern Ontario Co-ordinated Program Strategy.

District Land Use Guidelines (DLUG) have been developed for each administrative district of the Ministry based on the direction provided in the Co-ordinated Program Strategy. These guidelines provide objectives, targets, and general strategies for all resource management programmes, to ensure optimum use of resources with minimal conflict. Both the Minden and Bracebridge District Land Use Guidelines provide general direction to the fisheries management plannng process at the Frost Centre. The Frost Centre's Integrated Plan for Land Use and Resource Development provides specific direction for fisheries management. Technical direction for the Fisheries Management Plan was provided by the Strategic Plan for Ontario Fisheries (SPOF) which is a statement of fisheries management principles and techniques developed to fit Ontario problems and conditions. Management strategies are, therefore, based on these accepted resource management principles.

The Fisheries Management Plan highlights a number of background reports and analyses that were part of the planning process. Preceding documents include:

- **Terms of Reference** - outlines the planning process which provided direction for subsequent stages of the Fisheries Management Plan;
- **Detailed Background Report** - provides a detailed analysis of resource information including



MAP 2

LESLIE M. FROST NATURAL RESOURCES CENTRE -- AREA OF JURISDICTION

Leslie M. Frost Natural Resource Centre Fisheries Management Plan

1986-2000

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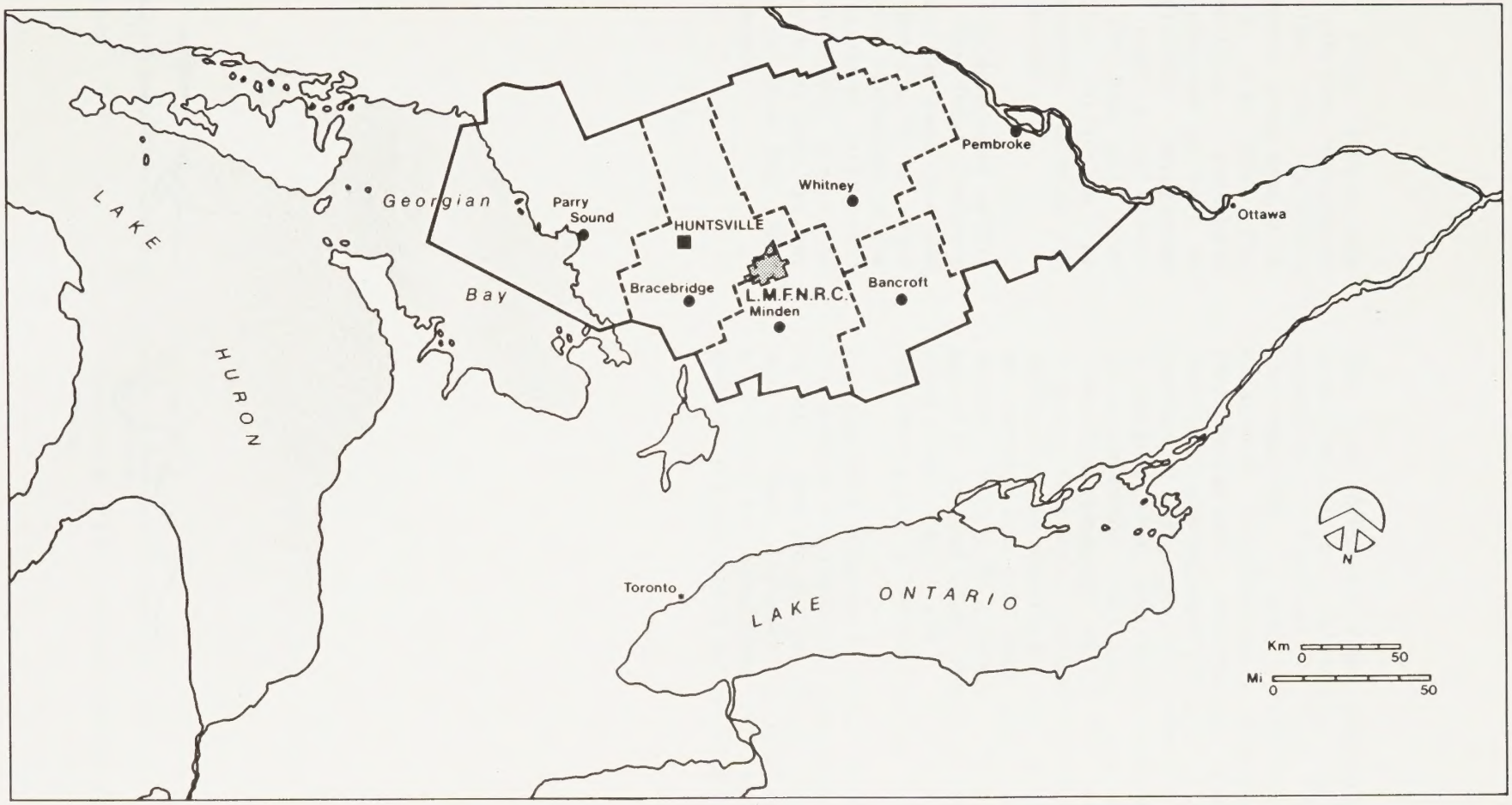
FIGURE 1: REGIONAL SETTING

LESLIE M. FROST NATURAL RESOURCES CENTRE

ALGONQUIN REGION



PREFACE

The Leslie M. Frost Centre has compiled this Fisheries Management Plan to provide the Centre's fisheries management programme with direction to the year 2000. The document identifies important resource considerations as well as long-term (1987-2000) management strategies and tactics to direct the programme. The Plan will also provide specific direction to annual work programme planning for the 1987-1991 period.

The Plan has been developed within the context of the Frost Centre's "Integrated Plan for Land Use and Resource Development". It is based on the information contained in the "Summary of Background Information and Optional Management Strategies and Tactics" report as well as the public response to this and other background documents.

The Plan contains four sections plus references, glossary, and appendices. Sections 1 and 2 (Introduction, and Fisheries Management Perspective), identify the background information for Section 3 (Management Direction). Section 3 includes the specific strategies that the Frost Centre will undertake to meet stated fisheries management objectives and targets. Section 4 (Implementation) identifies the strategies that will be carried out and what specific action will be taken. These specific actions (i.e. tactics) are identified in the 5 Year Implementation Schedules (Table 3).

The approved Plan will assist both the public and fisheries managers. It will provide a "benchmark" to ensure that future management activities are consistent with the purpose and direction of the Plan.

Regional Director
Algonquin Region

Director
Leslie M. Frost Natural Resources Centre

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fisheries yields, current and projected use, problems and issues, present fisheries management practices, and optional management strategies and tactics;

- **Summary of Background Information and Optional Management Strategies and Tactics** - provides a summary of the detailed background report for public distribution; and

- **Summary of Public Consultation for the Fisheries Management Plan Background Information and Management Options Stage** - outlines the results of public review of the background information and evaluation of management options.

The above documents are available for public review at the Frost Centre.

This Fisheries Management Plan outlines specific management strategies and tactics designed to meet the target identified in the Background Information and Optional Management Strategies and Tactics document. The targets are considerably lower than those in the Frost Centre's Integrated Plan for Land Use and Resource Development. They were revised to reflect better fisheries information now available. The public was given the opportunity to review the refined targets and no objections were raised. The refined targets have, therefore, been incorporated into the Fisheries Management Plan and an appropriate revision of the Integrated Plan for Land Use and Resource Development as well as Minden District Land Use Guidelines will be made.

The Fisheries Management Plan has been prepared for the period from 1987 to the year 2000, with an initial implementation schedule for 1987 to 1991. Minor amendments to the Plan may be required to implement new technology and management techniques. Annual work plans will be developed from the priorities established in the implementation schedule. The annual plans will identify specific projects to be carried out during each fiscal year. The Fisheries Plan will be reviewed and revised if necessary, at five-year intervals. Significant changes will be reflected in the Integrated Plan for Land Use and Resource Development through the appropriate amending procedure.

1.3 Existing Policy and Technical Direction

The Fisheries Management Plan has been written to comply with current Ministry policies, including that for integrated resources management. Wherever possible, integrated resources management will mean multiple use of resources to optimize benefits and minimize conflicts. In accordance with this policy, the Plan has been reviewed by (and modified according to the consensus of) all Frost Centre resource management specialists and received appropriate public review.

Other resource management plans are expected to influence the implementation of the Fisheries Plan. For example, timber management operations on the Frost Centre are currently governed by a twenty-year Timber Management Plan, (1980-2000), a five-year Operating Plan, and Annual Work Schedules.

Where these operations impact on water quality, habitat alteration or fish populations directly, consideration has been given under the existing guidelines for timber operations within the "Areas of Concern" policies. These policies allow for alteration of normal forest harvesting and tending operations to protect or enhance other resource concerns. While this Plan will not deal directly with each site it designates the process of "plan review" as the mechanism to alert managers to fisheries concerns where timber management or forest operations might affect the fisheries resource.

1.4 Public Consultation

The Ministry of Natural Resources is committed to public involvement in the fisheries management planning process. During this process public comment was sought and has been incorporated into the production of this Plan.

The first phase of public consultation included the publication of the "Summary of Background Information and Optional Management Strategies and Tactics," and an Open House in August, 1986. Analyses of public input indicates that respondents were generally favourable toward most strategies and tactics and the respondents felt that all potential problems, strategies and tactics had been identified.

Most respondents identified acidic precipitation as an important problem, along with water level fluctuations and overharvest of lake trout. Public education, habitat protection, water quality, law enforcement, data collection, and stocking were also identified as important concerns.

Additional public input approval would be required for any significant amendments to this Plan.

2.0 FISHERIES MANAGEMENT PERSPECTIVE

2.1 Role and Setting

The Frost Centre, part of the Algonquin Administrative Region of the Ontario Ministry of Natural Resources (Figure 1), is unique within the Ministry because it is both a resource management unit and a centre for resource management education. It began operation in 1974, with the goal:

> "to foster public understanding and appreciation of natural resources, their management and use".

The Frost Centre offers residential and day use programmes which provide experiences in the use and management of natural resources for both school and special interest adult groups. The Centre is staffed with resource management specialists who are responsible for management in the Frost Centre area, and who provide expertise in the development and delivery of interpretive programmes for Centre visitors.

Although situated in the Minden and Bracebridge Districts, the Frost Centre is responsible for fisheries management within its own area of jurisdiction. Management of the fisheries resource will be consistent with the overall direction set out in both the District Land Use Guidelines and the Frost Centre's Integrated Plan. Law enforcement and licence administration remain a District responsibility.

Situated in the southern reaches of the Precambrian Shield, the Frost Centre has 66 lakes (total area 3,700 ha), 39 streams, and 3 rivers, all of which drain into three major watersheds - The Black, Hollow, and Gull River systems. Dams in the Black and Hollow River watersheds are regulated by the Ministry of Natural Resources for recreational purposes. All other dams on the Frost Centre are operated by Environment Canada, Parks, primarily for navigational purposes as well as flood control on the Trent-Severn Waterway.

Most Frost Centre lakes have steep backshores, relatively small littoral zones, low nutrient and productivity levels, and are classified as oligotrophic or mesotrophic. The surrounding geology, soils, and drainage contribute little alkalinity, conductivity, or hardness to Frost Centre lakes. Compared to other lakes in southern Ontario in which nutrient levels are higher, littoral zones are larger, and surrounding soils are deeper, Frost Centre lakes are relatively less productive.

Black, Kabakwa, Buckhorn, and Lower Kushog Lakes, which occur only partially within the Frost Centre's administrative area, are managed by the adjacent districts, and are not included in this Plan.

Lake trout are the most popular sportfish species in the Frost Centre area, followed by brook trout and smallmouth bass. Almost half the anglers fishing on Frost Centre lakes are cottagers, the remainder being day-trippers or campers. Nearly 700 cottages are located on 18 of the Centre's developed lakes.

There are 6 family-vacation resorts in the Frost Centre area. Although angling is one of many water-related recreation activities pursued by resort guests, none of the resorts cater specifically to anglers.

In 1986, The United Townships of Sherborne, Livingstone, and McClintock conducted a study to determine future land needs for development purposes. These Townships, which cover the major portion of the Frost Centre, determined that there is sufficient patented land within their area to satisfy anticipated near-future demands for land for recreational (primarily cottaging) purposes. In addition to this, Crown land, which covers approximately 90% of the Frost Centre, has been assigned to multiple resource use. Consequently, land use trends or development are expected to remain similar to existing patterns.

Currently, two forest access roads, cottage subdivision roads, and an extensive network of summer and winter portages provide access to lakes and interior areas of the Frost Centre (see Figure 3, back pocket). These are maintained by the Centre. Some upgrading of these roads may occur during the planning period. Highway 35 is the main access to the western portion of the Frost Centre and the Centre's administration buildings.

2.2 Resource Use and Demand Projections

Methodologies for estimating sportfish production in rivers and streams or for estimating bait fish production are unavailable. Therefore, no estimate of production for rivers, streams, or bait fish is considered in this Plan, although it is recognized that some sportfishing opportunities will be provided by these rivers and streams.

The Frost Centre currently provides an estimated 10,700 sportfishing opportunities (1 opportunity is considered to be equal to 4 angler-hours), for an estimated total harvest of 2,900 kg of sportfish annually.

The projected demand for sportfish by the year 2000 is expected to increase to 12,300 opportunities for a sportfish harvest of 3,300 kg/yr. Projections are based on an anticipated population increase of 15% in southern Ontario, and the assumption that species preferences and angler success rates will remain the same as at present.

Total potential yield is an estimate of the amount of fish (by weight) that can be removed from the water on a sustained yield basis, if all Frost Centre lakes supported healthy sportfish populations. The total potential yield for all Frost Centre lakes is 7,600 kg/yr.

Allowable yield is a proportion of the total potential yield, and represents the estimated potential sportfish harvest that can be made available annually to anglers, while at the same time maintaining fish populations and fish community structure. Since there is no commercial fishery on the Frost Centre, 100% of the allowable yield is assigned to the sportfishery. The allowable yield of Frost Centre lakes which currently support sportfish, is 3,100 kg/yr (Table

1).

Because all Frost Centre brook and rainbow trout are maintained (by hatchery-reared fish) as artificial fisheries, as much as 100% of the total potential yield of these lakes can be assigned to the allowable yield.

Twenty-eight Frost Centre lakes currently do not produce fish species sought by anglers. The potential yield that could be realized from these lakes if brought into sportfish production is estimated to be 1,500 kg/yr. This would be in addition to the current allowable yield of 3,100 kg/yr.

2.3 Problems and Issues

There are a number of problems and issues affecting the achievement of the Frost Centre's fisheries targets which are outlined briefly in the following sections. If these problems and issues can be overcome or minimized the projected demand could be accommodated.

2.3.1 Overharvest of Lake Trout

Overharvest occurs when more fish are caught annually than the population can provide on a sustained yield basis (i.e., catch exceeds allowable yield). When overharvest of a top sportfish occurs, populations of less desirable species can expand because of reduced competition or reduced predation. Consequently, restoring the original sportfish population to its former status is usually difficult.

The present harvest of lake trout from the Frost Centre's lakes is almost double the allowable yield (Table 1). Most Frost Centre lake trout lakes are easily accessible and are developed with cottages.

Approximately 43% of total angler effort for all species in the Frost Centre area is directed toward lake trout, which represent 68% of the total sportfish harvest. Angler success is 0.43 kg/opportunity, which is much higher than the southern Ontario angling standard set at 0.2 kg/opportunity.

2.3.2 Habitat Loss or Degradation

Fisheries habitat consists of all aspects of a lake or stream necessary for the survival of a fish population.

Habitat loss is probably the most significant problem affecting the Frost Centre's fisheries, and is primarily the result of shoreline development, water level fluctuations, and the potential effects of acidification resulting from the long-range transport of acidic precipitation.

Shoreline development for cottages and resorts has contributed to habitat loss through:

- removal of shoreline vegetation, resulting in increased ground surface run-off and siltation of littoral zones;
- filling inshore or wetland areas for beaches;
- removal of spawning rubble for building retaining walls, etc.;
- removal of aquatic vegetation;
- dock, wharf, and boathouse con-

TABLE 1
CURRENT AND PROJECTED USE, RESOURCE POTENTIAL AND FISHERIES TARGETS FOR THE YEAR 2000, L.M.F.N.R.C.

	CURRENT USE		PROJECTED USE To the Year 2000 (Current Use + 15%, Keeping current angler success rates)		ALLOWABLE YIELD* (#Opportunites Based on Allowable Harvest and Provincial Angling Standards)		RESOURCE TARGETS[2]	
Species	Harvest (kg/yr)	Opportunities	Harvest (kg/yr)	Opportunities	Allowable Yield (kg/yr)	Opportunities	Harvest (kg/yr) (Including Under-Producing Waters)	Opportunities
COLDWATER								
Lake Trout	2,000	4,600	2,300	5,300	1,100	5,500	1,100	5,300
Other Trout	200	4,000	200	4,600	300	1,500	900	4,500
TOTAL COLDWATER	2,200	8,600	2,500	9,900	1,400	7,000	2,000	9,800
WARMWATER								
Smallmouth and Largemouth Bass	700	2,100	800	2,400	1,700	3,400	1,200	2,400
Other Species	?	?	?	?	?	?	MAINTAIN	
TOTAL	2,900	10,700	3,300	12,300	3,100	10,400	3,200	12,200

*Based on lakes currently supporting sportfish.

[1]Based on current angler success rates are .43 kg/opportunity for lake trout, .05 kg/opportunity for other trout, .33 kg/opportunity for smallmouth and largemouth bass.

[2]Based on Provincial angling success rate standards of 0.2 kg/opportunity for coldwater species and 0.5 kg/opportunity for warmwater species.

struction in shallow water areas; and

- nutrient loading from inefficient septic systems, which leads to weed and algae growth, and possible late-summer oxygen depletion.

The most highly developed lakes in the Frost Centre include Kushog, Wren, Raven, Big Hawk, Little Hawk, Big Brother, Saskatchewan and St. Nora.

Water level fluctuations, resulting from the regulation of dams, has led to the loss of fisheries habitat in a number of ways:

- Damming results in new water level regimes which alter the depth and nature of shallow water habitats (e.g. Raven Lake).

- Most Frost Centre lake trout lakes are regulated by water level control structures. Water level drawdowns which occur during or after spawning and prior to hatching and emergence of fry will result in reduced survival rates or, at worst, the elimination of year classes.

- Water level regulation has impaired water quality and habitat of some streams which at one time supported trout fisheries (e.g. Kennisis River). Water depth, flow, temperature, and oxygen levels appropriate for coldwater fisheries are not maintained year-round in these streams.

The problems associated with water level regulation stems from a lack of public awareness of the impacts on the fisheries resource, and the conflicting needs of various user groups, including cottagers, boaters, tourist operators, flood control agencies, and anglers.

2.3.3 Introductions of Competitor Fish Species

Introductions may result when anglers dump live bait into a lake, or when people intentionally (and illegally) try to "improve" a fishery by putting in species such as smallmouth bass or rainbow smelt. Such introductions often disrupt the original fish community in a lake by increasing competition and/or predation.

Brook trout are particularly vulnerable to competition with species such as yellow perch. Yellow perch and/or other spiny-rayed fish are known to occur in at least 14 Frost Centre lakes which are currently devoid of sportfish. Past attempts to plant brook trout in some of these lakes yielded poor returns.

Rainbow smelt have been accidently or illegally introduced into St. Nora, Kushog and Plastic Lakes. Smelt can seriously impact lake trout populations by preying on lake trout fry, and by competing with juvenile lake trout for food. In addition, although lake trout will use smelt as a source of food, some anglers dislike such trout because their flesh has a higher fat content and a stronger flavour.

Rock bass have, in recent years, become established in several local lake trout lakes. This species is an aggressive competitor, and can

have an adverse impact on lake trout and smallmouth bass populations.

This problem stems from a lack of public understanding of the concepts of fish community structure and carrying capacity, and the impacts of introductions on resident fish populations.

2.3.4 Under-producing Lakes and Streams

At present, 28 Frost Centre lakes, with a total area of 500 ha, do not support sportfish. These lakes could produce an estimated yield of 1,500 kg of sportfish annually. Yields from streams may be well below potential.

Factors limiting sportfish production include:

- lack of suitable habitat for self-sustaining populations;
- competition and/or predation with resident fish communities;
- public perception of "desirable" species, and under-utilization of species such as yellow perch and suckers;
- extreme water level fluctuations, due to the regulation of dams resulting in loss of coldwater habitat; and
- inconsistent supplies of hatchery fish for artificial trout fisheries, including both numbers and size of fish.

2.3.5 Dependence on Fish Stocking and Artificial Trout Fisheries

Approximately 37% of all current angling opportunities are provided by artificial brook and rainbow trout fisheries (Table 1). An estimated 25% of the lake trout caught are stocked fish.

While stocking of brook trout, rainbow trout, and splake in lakes formerly devoid of sportfish has created a substantial number of angling opportunities, it has also created a number of problems for managers, such as:

- supplies of hatchery fish are expensive and not always available to meet stocking schedules; and
- lack of spawning habitat for brook trout and rainbow trout means that stocking has to be repeated regularly.

The successes and attendant dependence however, have given the public the perception that stocking is the best, perhaps the only solution to all management problems when in fact habitat restoration or harvest reduction might be more appropriate and more economical. This is especially true when dealing with lake trout angling opportunities.

The maintenance or supplemental stocking of lake trout in lakes, which have a native but stressed natural population, further complicates management by introducing new genetic material. The long-term effects of this management tactic are not fully understood.

2.3.6 Inadequate Fisheries Data Base and Scientific Knowledge

The lack of precise data regarding fish populations can seriously hamper the effectiveness of management. Up-to-date (i.e., since 1979) and complete sportfish

harvest data are not available for Frost Centre lakes. The reliability of present biological productivity models is not known. Methodology is lacking to estimate bait fish production, or sportfish production in streams and rivers. There is a lack of scientific knowledge regarding stocking assessment, acidification in lakes and streams, and other complex issues.

The selection of management strategies and tactics presented in the following sections has been made with the objective of resolving these six major problems and issues. Together with the general fisheries management objectives of the Ministry and specific targets for the Frost Centre described in the next section, the strategies and tactics form the direction for this Plan.

3.0 MANAGEMENT DIRECTION

The basic direction for all Ministry management activities is established by the Ministry's various goals and objectives. These are identified in the Minden and Bracebridge District Land Use Guidelines and in the Frost Centre Integrated Plan for Land Use and Resource Development.

3.1 General Fisheries Management Direction

This Plan has been formulated in keeping with the goal adopted by the Ministry of Natural Resources:

> "to provide opportunities for outdoor recreation and resource development for the continuous social and economic benefit of the people of Ontario and to administer, protect and conserve public lands and waters."

The Frost Centre's objectives will be aligned to contribute positively toward this goal by meeting the Province's objectives and those specific to the Frost Centre. The general objective of fisheries management in southern Ontario is:

> "to provide opportunities for recreation and economic benefits consistent with the maintenance of healthy fish communities."

More specifically the fisheries objectives are:

Sportfishing

- to meet demand within the limits of a wisely managed and rehabilitated resource;

Bait Fishing

- to maintain current production;

Provincially Rare and Endangered Species

- to prevent the extinction of any native fish species.

Because the Frost Centre is unique within the Ministry of Natural Resources, distinct objectives were developed during the preparation of the Integrated Plan for Land Use and Resource Development. These objectives are:

- to provide a variety of opportunities related to the demonstration and interpretation of, and education in, natural resources, their management and use;

- to develop and implement integrated natural resources planning and management; and

- to provide opportunities for innovative and experimental resource management.

While these are somewhat different than those of Ministry districts, the second objective implies an emphasis on more specific direction which is compatible with the District Land Use Guidelines.

3.2 General Management Direction

To meet the Frost Centre's and other Ministry objectives, several basic management principles have been used in the selection of the preferred strategies and tactics. They are:

- ensuring harvests are consistent with the productivity of individual fisheries;

- protecting critical fish habitat including spawning beds, nursery areas and water quality, and carry out restoration where necessary;

- managing fish communities rather than individual species (strengthening or re-establishing fish communities will normally emphasize native species);

- developing a greater knowledge of fish populations and fish habitat conditions, and increasing scientific knowledge of the fisheries resource for more effective management;

- maintaining access to recreational fishing waters and improve the distribution of fishing pressure;

- encouraging greater public understanding of fisheries values, use, and management;

- creating and maintaining fisheries through a biologically sound fish stocking programme to provide angling opportunities in areas of high demand;

- encouraging co-operative fisheries management activities with organized groups and landowners;

- co-operating with other agencies in monitoring the effects of acid precipitation and contaminants in fish; and

- negotiating with the landowners and controlling agencies regarding the effect of their activities on fish, fish habitat, and fishing.

3.3 Specific Fisheries Management Targets and Strategies

The specific targets for the Frost Centre were identified and quantified as part of the background information for the Plan. They have been reviewed through the public participation process and, as no objections or revisions were noted, will remain as follows:

Lake Trout

- To provide 5,300 sportfishing opportunities and a harvest of 1,100 kg annually by the year 2000;

Other Trout (Brook Trout, Rainbow Trout and Splake)

- To provide 4,500 sportfishing opportunities and a harvest of 900 kg by the year 2000; and

Warmwater Sportfish

- To provide 2,400 sportfishing opportunities and a harvest of 1,200 kg annually by the year 2000.

These targets are based on a provincial angler success standard of 0.2 kg/opportunity for coldwater fisheries and 0.5 kg/opportunity for warmwater fisheries.

Because no commercial food fishery exists on the Frost Centre, no target has been established. The production of bait fish remains negligible. Bait fish production potential exists on the Frost Centre but lack of inventory data and demand analysis precludes the establishing of a specific target.

The refined sportfish target for the Frost Centre is a considerable reduction in the number of angling opportunities to be provided from that originally identified in the Frost Centre's portion of the Minden District Land Use Guidelines. This change simply reflects the use of more accurate information rather than any change in emphasis on management of the fishery. Further angling demand can be met within the Frost Centre, however, it will require a reduction in present catch standards for lake trout, resulting in a significant reduction in harvest. It will also require an increase in the production of other coldwater species such as brook trout, rainbow trout, and splake, and a significant shift toward the utilization of warmwater species.

3.4 Discussion

Table 1 presents the current and projected use of the Frost Centre's fisheries and provides the basis for the development of species specific targets. It should be noted that as walleye, northern pike and muskellunge do not occur in Frost Centre lakes no target has been established for them. Further, as the Ministry intends to work primarily with fish communities, a target will not be set for these species by this Plan.

3.5 Selected Strategies and Tactics

The most important part of the fisheries planning process is the selection of a course of action which will attempt to resolve management problems and achieve stated targets. This is accomplished through general strategies and specific targets.

Strategies can be defined as planned actions to achieve a desired end, while tactics are the specific management techniques that could be used to implement the strategy. All strategies selected should be:

- practical, and technically and financially feasible;
- contribute to the overall target;
- consistent with policy and legislation; and
- within the M.N.R.'s mandate.

Generally, priority has been given to those options which satisfy a broad range of fisheries targets. The selected management strategies and tactics presented below will be organized to address the problems and issues affecting the Frost Centre's fisheries:

- Overharvest of lake trout;
- Habitat loss and degradation;
- Introductions of competitor fish species;
- Under-producing lakes;
- Dependence on fish stocking; and
- Inadequate fisheries data base and scientific knowledge.

The relationship of these problems and issues to the species targets will also be discussed in the presentation.

It should be noted that the strategies and tactics presented in Table 2 represent current knowledge about the resource and presently applicable management techniques. They may be deleted or augmented as new technology and information becomes available. Additionally, the implementation of any or all of these strategies and tactics depends on funding. Therefore, they represent the direction and priority for management as funding allows.

The Frost Centre's first overall goal addresses the provision of education and interpretation in natural resources management and use. In this Plan there are several tactics which employ public education as a technique in fisheries management. Historically, the Centre has directed considerable effort toward interpreting concerns which are identified in this Plan. However, the "public" referred to in this Plan may include anglers, cottagers, landowners, and others who are not regular visitors to the Centre. Therefore, where the tactic of education is to be employed, specific reference will be made as to which of these publics is the designated audience.

TABLE 2

SELECTED FISHERIES MANAGEMENT STRATEGIES AND TACTICS

LESLIE M. FROST NATURAL RESOURCES CENTRE

LAKE TROUT SPORTFISHING

TARGET: To provide 5,300 lake trout sportfishing opportunities and a harvest of 1,100 kg of lake trout annually.

The problems associated with overharvest and water level fluctuations on the Frost Centre primarily affect lake trout at the present time. The management strategies which follow have been selected to meet the lake trout target, which is part of the overall fisheries target for the Frost Centre.

PROBLEM/ISSUE: OVERHARVEST OF LAKE TROUT

MANAGEMENT STRATEGIES	TACTICS	EVALUATION AND RATIONALE
Identify over-exploited lake trout populations	Conduct formal creel surveys on key lake trout lakes.	Management techniques directed at reducing angler harvest or improving yield will be assessed using reliable measures of fishing effort and success and applied at appropriate intervals. This was highly supported by the public in their review of optional strategies.
	Initiate volunteer creel surveys, possibly with incentives for anglers or with selected anglers only.	Voluntary creel surveys by selected anglers can offer partial information about harvest. However, they do not give reliable statistical indications of total harvest and/or effort.
	Monitor status of lake trout populations through live release assessment netting.	The public is opposed to assessment netting in general. However, if the live release netting technique is employed, then this type of essential biological data collection would be acceptable.
Reduce lake trout harvest		

It is not expected that lake-specific regulations to reduce the harvest of lake trout would be adopted in isolation of adjoining districts or divisions. Therefore, the tactics listed below represent the options which would be employed depending on the severity of the overharvest, direction provided in the district strategies, and public acceptance.

	Increase the general public's awareness of overharvest problem and encourage more angling of other trout species to help reduce fishing pressure on lake trout.	Many communications techniques exist which could be employed (i.e. seminars, tabloids, brochures, news releases, feature articles, etc.). In addition, the problem of overharvest is addressed in the current interpretive programme about fisheries management at the Frost Centre.
	Impose season closures on selected lakes (i.e. winter or spring).	Winter closures can be unpopular with the angling public. Despite this, it is accepted that most angler success is realized in winter and few opportunities are supplied, compared to open water seasons. For these reasons winter closures may be employed, where appropriate, in co-ordination with adjoining districts.

MANAGEMENT STRATEGIES	TACTICS	EVALUATION AND RATIONALE
Reduce lake trout harvest (continued)		
	Impose yearly quotas by issuing tags (e.g. 10 lake trout per year).	The public expressed concern with this tactic. This tactic will remain as an optional tactic in reducing the overharvest of lake trout when other management tactics prove unsuccessful.
	Limit ice-fishing to one line per angler.	The effectiveness of this strategy has not been clearly demonstrated and may be applied where appropriate.
	Implement gear restrictions (i.e. artificial lures only).	Public concern was expressed about the effectiveness of this tactic. It will remain an optional tactic, should it prove necessary or appropriate.
	Impose size limits (i.e. maximum, minimum, etc.).	The effectiveness of this strategy has not been clearly demonstrated and may be applied where appropriate.
	Continue to monitor lake trout spawning activities for potential illegal harvest.	Enforcement efforts by Minden and Bracebridge Districts can be improved by transferring knowledge about new areas identified and by prompt transmission of complaints or reports of illegal activity to the Frost Centre staff.
Enhance natural lake trout populations	Maintain supplemental lake trout stocking where populations cannot be self-sustaining, consistent with Regional M.N.R. policies.	This is an ongoing activity which can be refined to ensure the most efficient and productive use of hatchery fish. This tactic goes hand in hand with assessment activities. It was also supported by the public in their review of optional tactics.
	Rehabilitate habitat where loss of habitat is identified as limiting lake trout production.	Previous success with this tactic has proven encouraging. It may be a partial solution to the problems caused by water level fluctuations.

PROBLEM/ISSUE: HABITAT LOSS AND DEGRADATION - WATER LEVEL FLUCTUATIONS

MANAGEMENT STRATEGIES	TACTICS	EVALUATION AND RATIONALE
Determine extent of problem	Locate lake trout spawning beds in all Frost Centre lake trout lakes, and evaluate in relation to water level.	Techniques and expertise exist to accomplish this tactic. This knowledge is basic to any resolution of water level management problems. This was a highly supported tactic in the public review of optional tactics.
Ensure that water level control systems are operated in a manner compatible with fisheries management	Develop guidelines in co-operation with the Trent-Severn Waterway of Environment Canada.	A co-operative review of water level fluctuations, particularly, in relation to early drawdown of lake trout lakes, is already underway. Together with accurate spawning bed survey data, guidelines can be developed which should result in enhancement of natural reproduction of lake trout. Before guideline proposals are finalized, affected shoreline property owners, anglers and the Haliburton Highlands Water Level Management Advisory Committee will be consulted.
	Provide input during plan review regarding dams regulated by the M.N.R.	This is an extension of the process identified in the tactic noted above.
	Educate general public regarding effects of water level fluctuations on fish.	This is an indispensible adjunct to any changes in water level management and has been identified by Environment Canada as a responsibility which will fall to the Ministry. This was highly supported by the public in their review of optional strategies.

COLDWATER SPORTFISHING

TARGET: To provide 9,800 coldwater sportfishing opportunities (i.e. 5,300 lake trout and 4,500 other trout species) and a coldwater sportfish harvest of 2,000 kg annually to help achieve the coldwater fisheries target, which is part of the overall fisheries target.

The problem of competing fish species primarily affects the coldwater fisheries on the Frost Centre. The selected strategies and tactics are designed to help achieve the coldwater fisheries target, which is part of the overall fisheries target.

PROBLEM/ISSUE: INTRODUCTIONS OF COMPETITOR FISH SPECIES

MANAGEMENT STRATEGIES	TACTICS	EVALUATION AND RATIONALE
Manipulate populations of undesirable fish species	Remove coarse fish through lake reclamation.	This is a proven technique which has not been employed in recent years due to lack of funds. Previous experience has shown that excellent results have been obtained in carefully selected situations.
	Encourage utilization of coarse fish species through promotion and interpretation with Frost Centre clients as well as user groups such as cottagers.	This tactic can be implemented, but, it is difficult to assess its effectiveness. However, the long-term benefits of affecting more complete utilization of fish species and balanced harvest dictate that effort be directed through this tactic.
	Use mechanical and/or chemical means to remove coarse fish.	The removal of coarse fish will be directed at establishing community balance and reducing competition in situations where lake reclamation is not possible. This tactic might be considered experimental management.
Prevent further introductions of undesirable fish species	Educate general public regarding impacts of species introduction. Continue to emphasize this as part of the interpretive message delivered to Frost Centre visitors.	This tactic has been employed in the past. A continued effort with enhanced messages should be effective. This was supported by the public in their review of optional tactics.
	Impose no live-bait fish restrictions on selected lakes or areas.	This tactic is currently applied to any reclaimed lakes or in situations where the introduction of bait fish is a threat.

SPORTFISHING

TARGET: To provide 12,200 sportfishing opportunities and a sportfish harvest of 3,200 kg annually.

The following problems affect various fish species on the Frost Centre. Management options have been selected to deal with these problems in order to meet the overall fisheries target for the Frost Centre.

PROBLEM/ISSUE: HABITAT LOSS AND DEGRADATION - SHORELINE DEVELOPMENT

MANAGEMENT STRATEGIES	TACTICS	EVALUATION AND RATIONALE
Protect existing habitat	Monitor habitat and/or water quality where potential problems are suspected.	Detailed inventory data often does not exist, especially as it relates to littoral zone alterations. This type of information would enhance the Frost Centre's ability to evaluate potential problems and to direct protection efforts. This was highly supported in the public review of optional tactics.
	Continue to review both internal plans (i.e. timber management plans, road proposals, etc.) and external plans (dredging, filling, severances, etc.).	This is essential in order to integrate Ministry programmes and to reduce conflicts between fisheries concerns and other land and water users.
	Investigate suspected problems and enforce existing habitat protection legislation.	This is a legislative mandate under both provincial and federal law. Continued enforcement efforts will deter offenders.
	Educate general public about fisheries habitat, impacts of shoreline development and fisheries habitat legislation. Continue to emphasize this interpretive message to Frost Centre visitors.	This is an integral part of the Frost Centre's fisheries management interpretive programme. The public were very supportive of this tactic in their review which indicates they are anxious to be informed or they want others to be informed. Public awareness will perhaps be the best long-term protective management that can be effected.
	Encourage cottagers to participate in the Ministry of the Environment's "Self-Help" Programme.	This programme supports the above tactic as it involves the user in a capacity which elicits learning and stewardship toward the resource.
	Encourage the Ministry of the Environment to conduct septic tank inspection surveys on cottage lakes suspected of having water quality problems.	This would verify existing problems and allow for remedial action. In addition, the public was very supportive of this tactic.

MANAGEMENT STRATEGIES	TACTICS	EVALUATION AND RATIONALE
PROBLEM/ISSUE: UNDER-PRODUCING LAKES AND STREAMS		
Create new artificial coldwater fisheries	Reduce competition from coarse fish species through methods outlined in previous tactics dealing with undesirable species. Stock brook trout, rainbow trout, or splake where most suitable.	This tactic was supported by the public in their review of optional tactics and is a currently employed fisheries management technique.
	Create new coldwater fisheries in "non-motorized winter recreation area" and implement winter closures on these lakes.	This tactic has been initiated and will continue as hatchery stock becomes available.
	Establish trophy brook trout fisheries on selected lakes through such regulations as catch and release only, or a catch limit of only one fish over a certain size (i.e. slot size limit).	This tactic may be considered on a small number of lakes which, due to current restricted access, would maintain or increase opportunities if special catch regulations were instituted.
Ensure adequate supplies of hatchery fish	Optimize use of present supplies (i.e. priorize fish requirements according to angler returns or stocking assessment).	This tactic was highly supported by the public review of optional tactics. It is currently employed to help ensure hatchery fish are stocked in appropriate lakes.
	Continue to develop each year a four-year fish stocking schedule for the Frost Centre.	This tactic is currently employed according to existing Ministry procedures.
	Promote fish culture projects by public interest groups through CFIP.	This tactic would reduce demand on hatchery production and promote public involvement in in fisheries management.

MANAGEMENT STRATEGIES	TACTICS	EVALUATION AND RATIONALE
PROBLEM/ISSUE: DEPENDENCE ON FISH STOCKING AND ARTIFICIAL FISHERIES		
Reduce dependence on stocking	Continue stocking assessment to evaluate survival of hatchery plantings and assessment of coarse fish introductions.	This tactic is currently employed, but needs greater effort in order to evaluate and make more efficient use of hatchery fish.
	Continue to implement Regional policy of ceasing lake trout stocking in lakes with healthy natural populations of lake trout.	This is a continuing process and has implications on the reduction of the overharvest problems noted earlier.
	Educate general public regarding the perspective of stocking in fisheries management. Continue to emphasize this interpretive message to Frost Centre visitors.	This has been employed in our interpretive messages dealing with fisheries management on the the Frost Centre. Effort needs to be extended to other resource user groups through a communication strategy.
PROBLEM/ISSUE: INADEQUATE FISHERIES DATA BASE AND SCIENTIFIC KNOWLEDGE		
Attempt to fill information gaps in Frost Centre fisheries data base	Conduct intensive creel survey to obtain current harvest data.	While this tactic is relatively expensive it is necessary for evaluation and assessment of most other management efforts. The public strongly supported this tactic in their review of optional tactics.
	Increase involvement of Frost Centre fisheries staff in Ministry workshops, courses, and seminars, to ensure they are up-to-date with fisheries management.	This tactic is presented to highlight the need and effort required to keep staff current regarding fisheries management science.
	Attempt to acquire funding for small-scale experimental management projects.	This tactic would allow for the application of new and/or innovative approaches to fisheries problems.
	Encourage greater information exchange to ensure access to new knowledge from Ministry fisheries assessment units, districts and research branch.	The participation in any new or innovative management activity generally stimulates greater contact with other managers and agencies. This will improve knowledge, effectiveness, and results.

4.0 IMPLEMENTATION

4.1 General Background

All fisheries management activities will contribute toward attainment of the objectives and targets and be consistent with the strategies and tactics identified in this Plan.

It is intended that the strategies and tactics identified in this Plan will be achieved through:

- the preparation of a Five-Year Implementation Schedule (Table 3), outlining proposed programme and projects for the Plan's first five-year period (i.e. 1987-1991);
- the preparation of annual plans which implement specific programmes and projects, to be approved and funded through the Ministry's budget process;
- co-operative efforts with local interest groups under the Community Fisheries Involvement Program;
- the review and approval of work plans and development proposals from municipalities, private landowners, and other government agencies; and
- input or participation in other Ministry resource programmes to ensure accommodation of fisheries concerns (e.g. Timber Management Plans).

It is the Director's responsibility to implement the Plan, once approved by the Regional Director. The Plan will be reviewed on a regular basis and opportunities for public input will be provided.

Occasionally, minor amendments to the Plan may be required. For example, as a result of stocking assessment work a lake may be added to or deleted from the list of lakes to be stocked, or new management techniques may prompt a modification in the approach to a problem.

The intention of the Frost Centre is to review the Implementation Schedule to determine if amendments either to the Plan or the Schedule are warranted, owing to changes in scientific knowledge, techniques, resource data, a change in priorities or other circumstances. The Schedule will be updated internally on an annual basis to continually provide for a five-year operation planning framework. These regular reviews will assist in ensuring that the effectiveness and efficiency of the fisheries management programme is maximized.

All amendments to this Plan, where deemed appropriate, will be undertaken in accordance with the process outlined in the Ministry's "Procedures for Amending District Land Use Guidelines." The integrity of the broad direction, objectives, and targets outlined in the Plan will, however, remain paramount.

Some fisheries management projects identified in this Plan are subject to the requirements of the Environmental Assessment Act. As a result of complying with the environmental assessment requirements, changes in the order of completion of projects identified in the Plan may be warranted.

4.2 Implementation Schedule

The management strategies and specific tactics to be implemented during the initial five-year period of the Plan (i.e. 1987-1991) are identified in the Implementation Schedule (i.e. Table 3) which follows.

Annual work plans, intended to implement specific management strategies and tactics, will be developed according to the priorities established in the Implementation Schedule. A specific location and priority rating is indicated for each management activity. For those projects identified as "Priority 1," work can be accomplished with present staff and funds. (Routine administrative functions associated with fisheries management is not included). Activities requiring additional funds and staff or a shift in staff time expenditures are listed as Priority 2. Projects related to other tactics not identified in Table 3 will be identified according to priority in subsequent implementation schedules.

4.3 Summary of Management Emphasis (1987-1991)

The tactics have been carefully considered to ensure that they will be effective in implementing the Plan's management strategies. The tactics incorporate an appropriate mixture of management techniques available to fisheries managers.

While all of the tactics presented in this Plan address the problems identified in background documents, implementation through work programme planning, regional priority setting, and public concern will cause shifts in emphasis. The "priority" determinations based on existing funding, therefore, do not necessarily represent an equal emphasis on all tactics in this Plan.

Defining the extent of overharvest of lake trout and implementing harvest controls will receive emphasis in the first five-year implementation period. However, controls will be initiated only as part of a co-ordinated regional strategy. The importance of fisheries concerns relative to water level regulations is a second area of emphasis.

The development of fisheries in presently under-producing lakes is still another area of emphasis, as is the assessment and careful use of hatchery-reared fish in put-and-delay-take coldwater fisheries. The educational role of the Frost Centre will continue to be the most convenient vehicle for public education, primarily with groups visiting the Centre.

TABLE 3

FISHERIES MANAGEMENT IMPLEMENTATION SCHEDULE
1987/1991
LESLIE M. FROST NATURAL RESOURCES CENTRE

Tactic	Location	Priority 1	Priority 2	Intent
PROBLEM/ISSUE: OVERHARVEST OF LAKE TROUT				
Conduct formal creel surveys on key lake trout lakes.	Red Pine		x	Creel survey data are the basis on which managers can evaluate the success of many fisheries management projects. Without these data no quantitative or qualitative assessment can be made. This tactic also addresses the problem of "Inadequate Fisheries Data".
	Big Hawk		x	
	Little Hawk		x	
	Kushog		x	
	St. Nora		x	
	Margaret		x	
	Clear		x	
	Raven		x	
Initiate voluntary creel surveys, possibly with incentives for anglers or with selected anglers only.	Red Pine		x	This approach to the assessment of fisheries management efforts is less accurate quantitatively but can yield good qualitative information.
	Big Hawk		x	
	Little Hawk		x	
	Kushog		x	
	St. Nora		x	
	Margaret		x	
	Clear		x	
	Raven		x	
Monitor status of lake trout populations through assessment netting. This would be live release netting only.	Red Pine		x	Yield data from assessment netting relates to growth and reproductive success. These data also assist in the priorization of other forms of management.
	Big Hawk		x	
	Little Hawk		x	
	Kushog		x	
	St. Nora		x	
	Margaret		x	
	Clear		x	
	Raven		x	
Impose season closures on selected lakes (i.e., winter and/or spring)	To be determined	x		These tactics represent a range of applicable techniques which would reduce the harvest on lake trout. They would not be applied in isolation to the adjoining districts or without a more precise definition of the overharvest problem.
Impose yearly quotas by issuing tags (e.g., 10 lake trout per year).				
Limit ice-fishing to one line.				
Implement gear restrictions (e.g., artificial lures only).				
Impose size limit (e.g., maximum and/or minimum length).				

Tactic	Location	Priority 1	Priority 2	Intent
PROBLEM/ISSUE: OVERHARVEST OF LAKE TROUT (continued)				
Continue interpretive programmes to increase public awareness of the overharvest problem and encourage more angling of other trout species to help reduce fishing pressure on lake trout.	Frost Centre visitors	x		To develop a more supportive public opinion toward management efforts (e.g., quotas, gear restrictions, winter closures).
Increase public awareness of overharvest problem and encourage more angling of other trout species to help reduce fishing pressure on lake trout.	Local user groups		x	To develop a public opinion more supportive toward management effort (e.g., quotas, gear restrictions, winter closures).
Continue to monitor lake trout spawning for potential illegal harvest.	All known spawning areas		x	To minimize losses of trout through illegal fishing during the susceptible spawning period.
Maintain supplemental lake trout stocking where populations are not self-sustaining, consistent with Regional Ministry policies.*	Red Pine	x		To maintain fish populations where other limiting factors cannot be controlled.
	Big Hawk	x		
	Little Hawk	x		
	Kushog	x		
	St. Nora	x		
	Margaret	x		
	Raven	x		
	Sherborne	x		
	Nunikani	x		
	Clear	x		

*Depending on the results of ongoing stocking assessment studies, specific waterbodies may be added or deleted from the list of waters to be planted with hatchery-reared fish.

Tactic	Location	Priority 1	Priority 2	Intent
PROBLEM/ISSUE: HABITAT LOSS AND DEGRADATION – WATER LEVEL FLUCTUATION				
Develop guidelines in co-operation with the Trent-Severn Waterway of Environment Canada	Kushog	x		Where information and problems exist, guidelines should improve lake trout spawning success.
	St. Nora	x		
	Big Hawk		x	
	Little Hawk		x	
	Red Pine		x	
	Nunikani	x		
Locate lake trout spawning beds and evaluate water level fluctuation effects.	St. Nora		x	Identify location and extent of drawdown problems, to establish need for water level management guidelines.
	Kushog		x	
	Big Hawk		x	
	Little Hawk		x	
	Red Pine		x	
	Raven		x	
	Nunikani	x		
	Sherborne	x		
Provide fisheries input regarding dams regulated by the M.N.R.	Raven	x		To help protect spawning habitat and water quality.
Educate general public regarding effects of water level fluctuations on fish.	Frost Centre cottagers and landowners		x	To bring about public support and acceptance of proposed guidelines for water level management.
Rehabilitate habitat where loss, absence or degradation is identified as limiting lake trout production.	Little Hawk Additions as identified		x	To improve habitat quality and productivity of population.
PROBLEM/ISSUE: HABITAT LOSS AND DEGRADATION – SHORELINE DEVELOPMENT				
Habitat and/or water quality assessment where potential problems are suspected.	Wren Lake	x		To provide base data for evaluating applications for shoreline alterations and result in protection of habitat quantity and quality.
	Big Hawk		x	
	Little Hawk		x	
	Raven		x	
	Kushog		x	
	St. Nora		x	
Continue to review both internal plans and external plans regarding land use and resource development.		x		To help assure the protection of critical fisheries habitat.

Tactic	Location	Priority 1	Priority 2	Intent
PROBLEM/ISSUE: HABITAT LOSS AND DEGRADATION - SHORELINE DEVELOPMENT (continued)				
Investigate suspected problems and enforce existing habitat protection.	All Frost Centre lakes and watercourses	x		To deter individuals from destroying or negatively affecting fisheries habitat.
Continue to educate the public about fisheries habitat, impacts of shoreline development.	Frost Centre visitors	x		To reduce instances of habitat degradation by shoreline owners and cottagers.
Educate public about fisheries habitat, impacts of shoreline development.	Local users		x	To reduce instances of habitat degradation by shoreline owners and cottagers.
Encourage cottagers to participate in M.O.E.'s "Self-Help" Programme.	All lakes with cottage development		x	To develop a sense of public stewardship toward the resource and protect quality of habitat.
Encourage M.O.E. to conduct septic tank inspection surveys on cottaging lakes.	Wren Big Hawk Little Hawk Raven Kushog St. Nora Red Pine	x x x x x x x		To deter individuals from destroying or negatively affecting fisheries habitat.
Identify degraded habitat and determine extent of problem.	Wren Big Hawk Little Hawk	x	 x x	Data collected here would be basis for determining rehabilitation needs.
Priorize rehabilitation needs.	Based on above		x	To assist in work planning.
Encourage local interest groups to participate in rehabilitation projects under CFIP.	Depends on public interest		x	This would develop sense of public stewardship toward the resource and accomplish management objectives.

Tactic	Location	Priority 1	Priority 2	Intent
PROBLEM/ISSUE: HABITAT LOSS AND DEGRADATION - ACID PRECIPITATION				
Continue to liaise with agencies such as the M.O.E. and M.N.R. Acidification Study Group to facilitate the exchange of research findings from Frost Centre lakes.		x		To keep Frost Centre staff abreast on current knowledge about the problem and improve the quality of information we interpret to the public.
Conduct contaminant monitoring on sport fish populations within the guidelines and requirements of M.O.E.	Big Hawk Margaret		x x	This is a public health concern. Service traditionally provided by M.O.E./M.N.R.
Continue interpretive programmes that increase public awareness and understanding of the problem.	Frost Centre visitors	x		To help develop an informed public opinion.
Increase public awareness and understanding of the problem.	Local users		x	To help develop an informed public opinion.
PROBLEM/ISSUE: INTRODUCTIONS OF COMPETITOR FISH SPECIES				
Remove coarse fish through chemical lake reclamation.	Sampson's Pond Wallace Pond Buckskin Lake		x x x	A reduction of competitor fish species allows for the development of sportfish species sought by anglers. This tactic also addresses the problem of "Under-producing Lakes."
Encourage utilization of coarse fish species through promotion and interpretation.	Frost Centre visitors	x		A reduction of competitive fish species allows for the development of species sought by anglers.
Encourage utilization of coarse fish species through promotion and interpretation.	Local users		x	A reduction of competitive fish species allows for the development of species sought by anglers.
Use mechanical means to remove coarse fish during susceptible periods.	Silver Buck Silver Doe		x x	A reduction of competitive fish numbers should allow for the development and exploitation of the habitat by sport species.

Tactic	Location	Priority 1	Priority 2	Intent
PROBLEM/ISSUE: INTRODUCTIONS OF COMPETITOR FISH SPECIES (continued)				
Continue interpretive programme regarding impacts of species introductions.	Frost Centre visitors	x		This should result in fewer introductions of competitor fish species in lakes without serious problems at present.
Educate public regarding impacts of species introductions.	Local users		x	This should result in fewer introductions of competitor fish species in lakes without serious problems at present.
Impose no-live-bait fish restrictions on selected lakes or areas.	All reclaimed lakes	x		To help prevent the introduction of competitive fish species.
PROBLEM/ISSUE: UNDER-PRODUCING LAKES				
Create new coldwater fisheries (i.e. splake) in "non-motorized winter recreation area" and implement winter closures on these lakes.	Dan Lake Horse Lake McKeown Lake Three Island	x	 x x x	To establish fishery for desired sportfish where none currently exists and reduce conflict between cross-country skiers and snowmobilers.
Establish trophy brook trout fisheries on selected lakes.	Ronald Sampson's Pond Rabbit		x x x	To establish a high quality fishery.
Optimize use of present supplies of hatchery-reared fish according to angler contacts and repeated successes.	Applies to all lakes stocked with brook, rainbow or splake	x		By applying assessment data to stocking plans this tactic would ensure efficient use of stocked fish.
Continue to develop each year a four-year fish stocking schedule for the Frost Centre.*	Applies to all stocked lakes	x		By applying assessment data to stocking plans this tactic would ensure efficient use of stocked fish.
Promote fish culture projects by private interest groups (e.g., through CFIP).	Depends on public interest		x	This may reduce cost of stocking but identifiable interest groups are not currently available on Frost Centre Lakes.

*Depending on the results of ongoing stocking assessment studies, specific waterbodies may be added or deleted from the list of waters to be planted with hatchery-reared fish.

Tactic	Location	Priority 1	Priority 2	Intent
PROBLEM/ISSUE: DEPENDENCE ON FISH STOCKING AND ARTIFICIAL FISHERIES				
Conduct stocking assessment to evaluate survival of hatchery plantings.	Selected lakes 2 or 3 each year	x		To provide data upon which stocking rates and priorities are based.
Continue implementing Regional policy of eliminating lake trout stocking in lakes with good naturally reproducing populations of lake trout.	Red Pine Big Hawk Little Hawk		x x x	To reduce demand on hatchery stock. Implementation depends on more reliable estimates of survival, growth, and contribution of hatchery fish to the angler catch in these lakes.
Educate public regarding the perspective of stocking in fisheries management; Continue interpretation with Frost Centre visitors on this topic.	Frost Centre visitors and local users	x		To create a more knowledgeable public about the potential and benefits of stocking.
PROBLEM/ISSUE: INADEQUATE FISHERIES DATA AND SCIENTIFIC KNOWLEDGE				
Conduct intensive creel survey to obtain current harvest data.	Selected Frost Centre lakes based on assessment needs in conjunction with stocking program		x	These data are applicable to the evaluation and assessment of most fisheries management activities.
Increase involvement of Frost Centre fisheries staff in Ministry workshops, courses, and seminars, to ensure they are up-to-date with fisheries management.		x		To help ensure staff keep abreast of new knowledge and techniques.
Attempt to acquire funding for small scale experimental management projects.			x	To help ensure staff keep abreast of new knowledge and techniques.
Encourage greater information exchange to ensure access to new knowledge from Ministry fisheries assessment units, district and research branch.		x		To help ensure staff keep abreast of new knowledge and techniques.

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Allowable Yield

The yield by species as a result of partitioning the potential yield. The sum of allowable yields by species will not necessarily add up to the potential yield.

Angling Opportunity

A measure of recreation supply which is used to describe the number of times a resource or facility can be used (occasions of use) in a given time period. An opportunity is considered not to be greater than one day. (4 hours of fishing).

Artificial Fishery

A fishery which is maintained entirely through plantings of hatchery-reared fish in order to provide angling opportunities.

Bait Fish

Any member of the minnow family Cyprinidae, except: carp and goldfish, the mudminnow family Umbridae, the stickleback family Gasterosteidae, the trout-perch family Percopsidae, the sculpin family Cottidae, the genus Leucichthys of the whitefish family Coregonidae and the darter sub-family Etheostomatinae.

C.F.I.P.

Community Fisheries Involvement Program encourages management projects which endeavour to improve and enhance local fisheries or supply additional angling opportunities to the public. The funds for the projects are in part supplied by the Ministry of Natural Resources, while the work is done by volunteers. Funding is available to any interest group that has a project which qualifies for assistance.

Coarse Fish

Includes common white sucker, red horse sucker, long nose sucker, catfish, bullheads, garpike, bowfin, smelt, ling, carp, rock bass and pumpkinseed.

Coldwater Fish

Fish species which prefer to live in waters which have summer temperatures below 15^{o}C. Important fish species in this category include lake trout, splake, brook trout, rainbow trout, coho salmon, chinook salmon, pink salmon, lake whitefish, lake herring, and deep water cisco (chub).

Coldwater Lakes

Those lakes having characteristics which would support salmonids (trout).

Commercial Fish

Any fish that are legally harvested by the commercial fishing industry.

Fish Community

A combination of different fish species living and interacting in the same body of water.

Goal

A general purpose to which the Ministry aspires.

Important Fish Habitat

Any fish habitat required for the maintenance of a healthy fish population including spawning, nursery and feeding areas, as well as, travel routes.

Littoral Zone

The important shallow water areas, generally near shore, where most fish spawning and nursery areas occur, and where the majority of a lake's aquatic production takes place.

Management

The judicious use of means to achieve ends. Management may have various levels of intensity. For example, if a high degree of technology is used, or if very careful tending is given, the management is high level.

Objective

A quantifiable and attainable end, which the Ministry's efforts are intended to accomplish.

Potential Yield

The amount of fish flesh that can be removed from the water on a sustained basis.

Rehabilitation

This term may be applied to both fish populations and fisheries habitat. In both instances, rehabilitation denotes efforts to enhance or restore a degraded or stressed situation.

Resident

An angler whose principle residence is in Ontario. (A local resident angler would be one who can fish an area on a day-use basis, i.e. travel to the area, fish, and return home on the same day).

Resource Management

The wise use of a particular resource such as fish to achieve a specific end.

Sportfish

Any fish that are legally caught by angling.

Strategic Planning for Ontario Fisheries (S.P.O.F.)

Task force (in the form of working groups) established to assess the status of Ontario fisheries and to recommend courses of action or strategies for the future.

Strategy

Planned actions or measures to achieve a desired end.

Tactic

A method devised to achieve one or more strategies.

Target

A quantified end to be achieved or completed by a certain date.

Under-producing Lakes and Streams

Waters from which the production is constrained because of stresses such as water quality, species composition, overharvest, undesirable species or absence of sportfish species.

Warmwater Fish

Fish species which prefer to live in waters which have summer temperatures ranging from 22 to 30°C. Important fish species in this category include largemouth bass and black crappie.

Warmwater Lakes

Those lakes other than coldwater lakes.

APPENDICES

APPENDIX 1

SUMMARY OF PUBLIC CONSULTATION FOR THE FISHERIES MANAGEMENT PLAN BACKGROUND INFORMATION AND MANAGEMENT OPTIONS STAGE

LESLIE M. FROST NATURAL RESOURCES CENTRE

The initial phase of public consultation for the Leslie M. Frost Natural Resources Centre Fisheries Management Plan took place in August, 1986. At this stage, public review and comments were invited on the Summary of Background Information and Optional Management Strategies and Tactics.

Methods Used to Encourage Public Involvement

To advertise that a) the Summary had been published and was available to the public, and b) that an Open House would be held for public consultation, a variety of communication techniques were used.

News releases were sent to various local newspapers. A joint news release by Bracebridge District and the Frost Centre was sent to the Muskoka newspapers. Six articles appeared during the two weeks prior to the Open House.

Approximately 1,300 advertising tabloids were distributed to 40 stores, resorts and information centres in the Dorset, Carnarvon, Minden and Dwight areas between August 13 and 21, 1986.

Copies of the Summary and questionnaire were distributed to 22 important user groups and individuals prior to the Open House.

The Open House was held on Friday, August 29, 1986 from 10:00 a.m. to 8:00 p.m. and on Saturday, August 30, 1986 from 10:00 a.m. to 4:00 p.m. It consisted of a series of displays set up in the building which was once the Frost Centre's "visitor centre". Three staff were present to meet and speak with the public who attended. Copies of the Summary and a questionnaire were given to each visitor. The due date for completed questionnaires was September 12, 1986. In total, approximatly 50 summaries and 55 questionnaires were distributed.

Public Participation

A total of 63 people attended the Open House, including 53 members of the general public and 10 M.N.R. employees. Only 5-6 participants were actually Frost Centre anglers.

No verbal comments were received during the Open House that were specifically related to Frost Centre fisheries or the Fisheries Management Plan. A significant portion of the verbal communication involved general questions about acid rain and effects on various lakes.

Twelve questionnaires and one letter without a questionnaire were returned, which represent a 24% response rate. Six questionnaires were completed during the Open House by people who did not read the Summary. The remaining 6 represented members of two cottagers' associations and Zone 5 of The Ontario Federation of Angler and Hunters. An additional letter from Parks Canada/Trent-Severn Waterway provided comments representing that agency's concerns. A breakdown of respondent type is given in Table 1.

TABLE 1

Respondent Type - Questionnaire (12) and Letters (1)

Type	Number	Percentage
Frost Centre Cottager/Angler	6	46
Fish and Game Club	1	8
Other Government Agencies	1	8
Conservation Officer	1	8
Other Open House Visitors	4	30
TOTAL	13	100

Responses on the questionnaires were tallied. Responses were generally favourable towards most strategies and tactics, and 75% of the respondents felt that all potential problems, strategies and tactics had been identified.

Most respondents (92%) identified acidic precipitation as an important problem. Eight-four percent thought that water level fluctuations and overharvest of lake trout were important.

The most positive responses (greater than 80% of respondents) were received for the following:

Strategies

-Assess the rate and impacts of acidification on Frost Centre lakes (92%).

-Attempt to integrate water level control with fisheries management (83%).

-Identify over-exploited lake trout populations (83%).

Tactics

-Educate general public about fisheries habitat, impacts of shoreline development and fisheries habitat legislation (100%).

-Monitor habitat and/or water quality where potential problems are suspected (92%).

-Encourage Ministry of Environment to conduct septic tank inspection surveys on cottage lakes suspected of having water quality problems (92%).

-Locate lake trout spawning beds in all Frost Centre lake trout lakes (92%).

-Conduct formal creel surveys on key lake trout lakes (92%).

-Enforce existing regulations re: no live-bait fish restrictions (92%).

-Optimize use of present supplies of hatchery fish, (i.e. priorize fish requirements according to angler returns or stocking assessment (92%)).

-Conduct intensive creel survey to obtain current harvest data (92%).

-Monitor water levels on lake trout lakes through the year (83%).

-Monitor lake trout spawning success (83%).

-Negotiate water level fluctuation agreements with Parks Canada (83%).

-Educate general public regarding effects of water level fluctuations on fish (83%).

-Liaise with agencies such as the M.O.E. and M.N.R. Acidification Study Group to facilitate the exchange of research findings from Frost Centre lakes (83%).

-Continue monitoring acidity levels of Frost Centre lakes (83%).

-Maintain supplemental lake trout stocking where populations cannot be self-sustaining, consistent with Regional M.N.R. policy (83%).

-Educate general public regarding impacts of species introductions (83%).

-Stock brook trout, rainbow trout or splake where each would be most suitable (83%).

Tactics (continued)

-Encourage greater utilization of warmwater species (83%).

-Increase involvement of Frost Centre fisheries staff in M.N.R. workshops, courses and seminars, to ensure they are kept up-to-date with fisheries management within the rest of the M.N.R. (83%).

The least favourable responses were received for:

-yearly quotas for lake trout (75% of respondents opposed).

-gear restrictions (58% opposed).

-assessment netting of lake trout (50% opposed).

-reduce access (50% opposed).

Analysis of the public input received at this stage were considered during the selection of preferred management strategies and tactics for formulation of the Fisheries Management Plan.

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